

REMARKS

In view of the preceding amendments and the comments which follow, and pursuant to 37 C.F.R. § 1.111, amendment and reconsideration of the Official Action of February 13, 2003 is respectfully requested by Applicants.

Summary

Claims 1 – 16 stand rejected. Claims 1, 9, 12 and 16 have been amended. Claims 8 and 11 have been cancelled. Claim 17 has been added. No new matter has been introduced as a result of this amendment. Claims 1 – 7, 9, 10, 12 – 17 remain pending following entry of the present amendments and remarks.

Interview Summary

The interview initiated by Kader Gacem, was held on September 16, 2004. The Examiner indicated in the Office Action mailed on July 22, 2004, that the Applicant's arguments failed to place the above identified application in condition for allowance. The phone interview revolved over the rejection of claims 1 – 2 under 35 USC 102 (e) as being anticipated by Mack et al. (Mack) (U.S. Patent No. 6,462,919 B1) as evidenced by Slaughter (Slaughter) (U.S. Patent No. 6,549,454 B1).

The Examiner maintained that in Figures 6A and 6B of Mack the Ru layer located above the free layer is not completely etched per Mack's instructions in Figure 11, and therefore anticipate the corresponding feature claimed by the Applicants.

Further, the Examiner offered to discuss distinguishable features of Applicants Figures 5 and 7 over Mack, in that Applicants second and third antiferromagnetic layers are disposed directly on the nonmagnetic layers. No agreement with respect to the claims was reached.

Rejection under 35 U.S.C. § 102

The Examiner has rejected Claims 1, 2, 7 – 10, and 13 – 16 under U.S.C. 102(e) as being anticipated by Mack et al. (Mack) (U.S. Patent No. 6,462,919 B1) as evidenced by Slaughter (Slaughter) (U.S. Patent No.

6,549,454 B1). The amended Claim 1 relates to a magnetic sensing element which comprises a laminate. The laminate includes a first antiferromagnetic layer, a pinned magnetic layer, a nonmagnetic conductive layer, a free magnetic layer, a nonmagnetic interlayer, a ferromagnetic layer, a second antiferromagnetic layer, a third antiferromagnetic layer disposed under the second antiferromagnetic layer, and a nonmagnetic layer disposed between the second antiferromagnetic layer and the ferromagnetic layer, with the second and third anti ferromagnetic layers magnetically couple with the ferromagnetic layer to orient a magnetization of the ferromagnetic layer in a predetermined direction.

Further, Claim 1 recites that "the laminate has a recess extending through the second antiferromagnetic layer, the third antiferromagnetic layer, the nonmagnetic layer and the ferromagnetic layer, a bottom face of the recess lying in the nonmagnetic interlayer, a width of the bottom face in a track width direction being equal to a track width."

Thus, as claimed the recess extends through the second and third anti-ferromagnetic layers, the nonmagnetic layer, the ferromagnetic layer and the nonmagnetic interlayer, which are, as stated above, sequentially layered on top of the free layer. Applicants submit that this structure of the magnetic sensing element is not taught or suggested by Mack. In Mack, neither the synthetic antiferromagnetic structure nor the exchange tab layer comprises a nonmagnetic layer and a second antiferromagnetic layer positioned sequentially on the ferromagnetic layer.

In regard to Slaughter, the Examiner points out that Slaughter discloses that in a GMR material, the spacer layer is conductive, while in a TMR material, the spacer layer is insulating. However, Applicants submit that the Slaughter supported (evidenced) argument is now moot in view of the Claim 1 amendment.

As such, Claim 1 is therefore not rendered unpatentable by Mack as evidenced by Slaughter. Claims 2 - 16 are each dependent on claim 1, either directly or indirectly, and are therefore likewise patentable. Applicants therefore respectfully request that the rejections of Claims 1 – 16 under 35 U.S.C. § 102(e) be withdrawn.

Rejection under 35 U.S.C. § 103

The Examiner has rejected Claim 15 under 35 U.S.C. § 103 (a) as being unpatentable over Mack as evidenced by (Slaughter). As discussed above, the amended Claim 1 now recites the nonmagnetic layer disposed between the third antiferromagnetic layer and the ferromagnetic layer in contrast to Mack. Further, Slaughter is also silent about the nonmagnetic layer and second antiferromagnetic layer feature. As such, Applicants submit that the cited references may not be combined to support the Examiner's obviousness rejections. Applicants therefore respectfully request that the rejections of Claim 15 under 35 U.S.C. § 103(a) be withdrawn.

The Examiner has next rejected Claims 3 – 6, 13 and 14 under U.S.C. 103(a) as being unpatentable over Mack as evidenced by Slaughter, and further in view of Sakakima et al. (Sakakima) (U.S. Patent Application No. 2003/0197505 A1). Since Sakakima teachings relate to CoFeNi alloys, Applicants advances that all three cited references fail to disclose the nonmagnetic layer and second antiferromagnetic layer feature, and thus may not be combined to support the Examiner's obviousness rejections. Applicants therefore respectfully request that the rejections of Claims 3 – 6, 13 and 14 51 under 35 U.S.C. § 103(a) be withdrawn.

The Examiner has next rejected Claims 11 and 12 under U.S.C. 103(a) as being unpatentable over Mack evidenced by Slaughter as applied above, and further in view of Araj et al. (Araj) (JP 11-175919 A). Claim 11 has been deleted, as a feature of Claim 11 was incorporated into Claim 1. Accordingly, Claim 12 now depends on Claim 1. Applicants submit Araj is also silent about a nonmagnetic layer being disposed between the second antiferromagnetic layer and the ferromagnetic layer. Thus, the three cited references may not be combined to support the Examiner's obviousness rejections. Applicants therefore respectfully request that the rejections of Claim 12 under 35 U.S.C. § 103(a) be withdrawn.

Conclusion

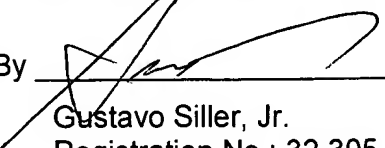
Applicants submit that this application is now in condition for allowance, and favorable reconsideration of this application in view of the above

amendments and remarks is respectfully requested. If, there are additional fees due, Applicant requests that this paper constitutes any necessary petition and authorizes the Commissioner to charge any underpayment, or credit any overpayment, to Deposit Account No. 23-1925.

If the examiner finds that there are any outstanding issues which may be resolved by a telephone interview, the Examiner is invited to contact the undersigned attorney at the below listed number

Respectfully submitted,
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